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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,474	12/12/2003	Eric C. Leuthardt	60005161-0061	2473

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SONNENSCHN NATH & ROSENTHAL LLP
P.O. BOX 061080
WACKER DRIVE STATION, SEARS TOWER
CHICAGO, IL 60606-1080

EXAMINER

MALLARI, PATRICIA C

ART UNIT PAPER NUMBER

3736

DATE MAILED: 07/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/735,474	Applicant(s) LEUTHARDT ET AL.	
	Examiner Patricia C. Mallari	Art Unit 3736	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 May 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>1/31/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This is a non-final Office action. New grounds of rejection have been presented which were not necessitated by the applicants' amendments to the claims.

Claim Objections

Claim 1 is objected to because of the following informalities: on line 3 of claim 1, "user configured" should be replaced with "user and configured". Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-4 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claim 1 recites, "array . . . implanted beneath the scalp of a user" on lines 2-3 of the claim. The scalp is a part of a human body which is non-statutory subject matter and cannot be positively claimed. To overcome this rejection, the applicants should replace "array implanted" on line 2 of the claim with "array adapted to be implanted".

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 7 is rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. Steps including monitoring the user's brain activity,

collecting ECoG signals of the user's brain activity, processing the ECoG signals to determine the intent of the user with respect to the output device, generating a device command from the intent of the user, and communicating the device command to the output device are critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). It is unclear how the method of providing control of an output device can be fully effected by merely providing an ECoG based BCI to the user and communicating the intent of the user, as claimed. More specifically, it is unclear how the intent of the user, which is to be communicated to the output device, is obtained. Claim 8 delineates the missing steps and further shows that these steps are essential to execution of the method.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, and 5-8 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent Publication No. 2005/00113744 to Donoghue et al. Donoghue teaches a brain computer interface (BCI) comprising an electrocorticography (ECoG) electrode array 120 implanted beneath the scalp of a user and configured for acquiring ECoG

signals from the subject (figs. 1 & 2; paragraph 34 of Donoghue), wherein paragraph 0034 states that the implant 120 may obtain information in the form of ECoGs. An acquisition computer 110 is coupled to the array 210 for collecting and storing the ECoG signals (fig. 1, paragraphs 24-25 of Donoghue). A BCI computer 150 is coupled to the acquisition computer 110 and has software configured to analyze the ECoG signals to determine an intent of the user (figs. 6A-C; paragraphs 23, 30, 84, 91, 95, and 98 of Donoghue).

Regarding claims 2 and 6, an output device is coupled to the BCI computer, wherein the BCI computer is configured to generate a device command from the intent of the user to control the output device (figs. 6A-C; paragraphs 83, 84, 91, 95, and 98 of Donoghue).

Regarding claim 7, Donoghue further teaches a method of providing control of an output device by a user wherein an electrocorticography based BCI is provided to the user, the ECoG based BCI configured for determining an intent of the user from ECoG signals of the user's brain activity (figs. 6A-C; paragraphs 23, 24, 30, 34, 83, 84, 91, 95 and 98 of Donoghue). The intent of the user is communicated to the output device (figs. 6A-C; paragraph 98 of Donoghue).

With further regard to claim 8, the brain activity of the user is monitored and ECoG Signals are collected (paragraphs 23, 24, 34, and 83 of Donoghue). The ECoG signals are computer processed to determine the intent of the user with respect to the output device, and a device command is generated from the intent of the user, which

device command is communicated to the output device (figs. 6A-C; paragraphs 83, 84, 91, 95, and 98 of Donoghue).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 4, 10, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Donoghue, as applied to claims 1, 2, and 5-8 above, and further in view of US Patent NO. 6,615,076 to Mitra et al. Donoghue is silent as to a specific frequency range of signals that are acquired. However, Mitra teaches a brain computer interface (BCI) and method of using such BCI wherein the BCI determines an intent of user from acquired brain signals from the user, wherein the electrode array 804 of Mitra provides signals of mu (8-12Hz', see p. 7, lines 5-7 of the instant specification), beta, and gamma rhythms of the user as well as signals having a significant frequency content of greater than about 40 Hz (col. 5, lines 23-32', col. 7, lines 42-48). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use the frequency ranges specified by Mitra as those of Donoghue, since Donoghue teaches acquiring brain signals to determine an intent of a user, and Mitra describes frequency ranges of signals for such a determination.

Claims 9 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Donoghue, as applied to claims 1, 2, and 5-8 above, and further in view of Mitra.

Donoghue discloses generating a device command to an output device based on the intent of the user (paragraphs 84 and 85 of Donoghue), where the device may be a computer mouse, but lacks monitoring a position of the output device and providing feedback. However, Mitra describes a method for providing control of an output device based on the intent of user, where a feedback controller 824 may monitor the response of the output device, and provide feedback to the user on the position of the output device with respect to a target position (col. 8, lines 27-40 of Mitra). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to combine the method of Mitra with that of Donoghue in order to improve control of the output device, wherein the feedback controller of Mitra clearly provides improved control.

Regarding claim 12, the ECoG signal may be reanalyzed to determine an intended correction by the user with respect to the cursor movement (col. 8, lines 33-40 of Mitra), where processing a subsequent signal in which the use has compensated for error is a reanalysis of ECoG signal to determine the intended correction by the user, and generating a command based on the compensated intended movement is a communication of the intended correction to the computer monitor to modify cursor movement. Also, movement of a computer mouse effects cursor control on a computer monitor.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Donoghue, in view of Mitra, as applied to claims 9 and 12 above, and further in view of US Patent No. 5,638,826 to Wolpaw. Donoghue, as modified, is silent as to the number of dimensions of movement considered in analyzing the ECoG signal and

communicating the user's intent to the computer display. However, Wolpaw discloses a method of controlling cursor movement on a computer display using brain activity. The brain activity is analyzed to determine the user's intent with respect to the cursor movement in at least two dimensions, and a command to move the cursor in at least 2 dimensions is generated (col. 8, line 59-col. 9, line 52; col. 11, lines 45-55 of Wolpaw). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to combine the method of Wolpaw with that of Donoghue, as modified by Mitra, since Donoghue, as modified, discloses analyzing brain activity to effect cursor movement, and Wolpaw describes an appropriate way of doing so.

Response to Arguments

Applicant's arguments, see pp.6-11, filed 5/2/05, with respect to the rejection(s) of claims 1, 2, and 5-8 35 under U.S.C. 102(b), claims 1-4 and 6-12 under 35 U.S.C. 102(e), and claims 12 and 13 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of US Patent application Publication No. 2005/0113744 to Donoghue et al.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patricia C. Mallari whose telephone number is (571) 272-4729. The examiner can normally be reached on Monday-Friday 10:00 am-6:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Max Hindenburg can be reached on (571) 272-4726. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Patricia Mallari
Patent Examiner
Art Unit 3736


MAX F. HINDENBURG
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3700